

5.15 COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table 5.15-1 provides a comparative summary of the potential environmental consequences that could result from implementing each of the four alternatives evaluated in this EA.

TABLE 5.15–1.—Summary of Environmental Consequences for the ORNL Facilities Revitalization Project Alternatives

Resource/Material Categories	Alternative 1 - No Action	Alternative 2 - Remodel	Alternative 3 - Brownfield	Alternative 4 - Greenfield
Earth Resources, Geology and Soils				
<u>Construction</u>	No new FRP construction or other activities that could potentially increase soil erosion or disturb underlying materials	Remodeling and demolition could temporarily disturb up to 0.2 ha (0.5 acres) and could potentially increase soil erosion or disturb underlying materials	Construction and other activities could temporarily disturb up to 12 ha (30 acres), potentially increasing soil erosion or disturbing underlying materials to a maximum depth of 1.2 m (4 ft)	Construction and other activities could temporarily disturb up to 18 ha (45 acres), potentially increasing soil erosion or disturbing underlying materials to a maximum depth of 3.6 m (12 ft)
<u>Operations</u>	No increase in soil erosion or impact to geology	No increase in soil erosion or impact to geology	No increase in soil erosion or impact to geology	Potential for increased soil erosion would be mitigated; no impact to geology
Water Resources				
Groundwater:				
<u>Construction</u>	No new FRP construction or change in groundwater use or quality	No change to groundwater use or quality	No change to groundwater use or quality	No change to groundwater use or quality
<u>Operations</u>	No groundwater requirement or change in groundwater use or quality	No change to groundwater use or quality	No change to groundwater use or quality	No change to groundwater use or quality
Surface water:				
<u>Construction</u>	No new FRP construction or other activities that could potentially change underlying water usage or requirements	No activities that could potentially change underlying water usage or requirements	No activities that could potentially change underlying water usage or requirements; erosion controls measures would be needed to avoid or mitigate potential sediment loading in the creek	No activities that could potentially change underlying water usage or requirements; extensive erosion controls measures would be needed to mitigate potential sediment loading in the creek

**TABLE 5.15–1.—Summary of Environmental Consequences for the ORNL Facilities Revitalization Project Alternatives
(continued)**

Resource/Material Categories	Alternative 1 - No Action	Alternative 2 - Remodel	Alternative 3 - Brownfield	Alternative 4 - Greenfield
<u>Operations</u>	No change in water usage	No change in water usage	No change in water usage	No change in water usage; some sedimentation controls required on slopes
Ecological Resources				
Threatened and Endangered Species:				
<u>Construction</u>	No new FRP construction or other activities that could potentially affect threatened and endangered species	No effects to threatened and endangered species would be anticipated during limited remodeling or demolition activities	No effects to threatened and endangered species would be anticipated because previously disturbed Brownfield land would be used	No effects to threatened and endangered species would be anticipated on previously disturbed Brownfield areas; potential adverse effects in Greenfield area would be avoided by modifying conceptual plans or mitigation
<u>Operations</u>	No effects to threatened and endangered species	No effects to threatened and endangered species would be anticipated	No effects to threatened and endangered species would be anticipated, unless the presence of bats seems likely based on the biological assessments that are currently in progress; mitigation would be provided, as appropriate	No effects to threatened and endangered species would be anticipated, unless the presence of bats seems likely based on the biological assessments that are currently in progress and that no other sensitive species were identified during additional assessments of the area; if any sensitive species were present, adverse effects would be avoided by modifying conceptual plans or mitigation

**TABLE 5.15–1.—Summary of Environmental Consequences for the ORNL Facilities Revitalization Project Alternatives
(continued)**

Resource/Material Categories	Alternative 1 - No Action	Alternative 2 - Remodel	Alternative 3 - Brownfield	Alternative 4 - Greenfield
Wetlands and Floodplain:				
<u>Construction</u>	No FRP construction or other activities that could potentially affect wetlands	No activities that could potentially affect wetlands or the floodplain	Some indirect effects to small wetlands could occur, but would be mitigated through appropriate protective measures; no activities would occur within the floodplain	No change to wetlands or floodplain would be anticipated; no activities would occur within the floodplain
<u>Operations</u>	No change to wetlands or floodplain	No change to wetlands or floodplain	No change to wetlands or floodplain	No change to wetlands or floodplain would be anticipated; no activities would occur within the floodplain
Biota and Habitat:				
<u>Construction</u>	No FRP construction or other activities that could potentially affect local habitat or biota	No activities would occur that could potentially affect habitat; noise levels could increase temporarily, but would be localized within central ORNL	Effects to biota would be limited to disturbance from temporarily increased noise levels during FRP construction and other activities; habitat would not be affected because previously disturbed Brownfield land would be used for construction with the exception of one acre in Melton Valley	Effects to biota would include disturbance from temporarily increased noise levels during FRP construction and other activities; up to 18 ha (45 acres) of Greenfield habitat could be affected during construction activities, including 0.4 ha (1 acre) in Melton Valley

**TABLE 5.15–1.—Summary of Environmental Consequences for the ORNL Facilities Revitalization Project Alternatives
(continued)**

Resource/Material Categories	Alternative 1 - No Action	Alternative 2 - Remodel	Alternative 3 - Brownfield	Alternative 4 - Greenfield
<u>Operations</u>	No change to local habitat or biota	No change to local habitat or biota	No change to local habitat or biota would be anticipated with the exception of up to one acre of upland habitat that could be lost in the 7600 Area of Melton Valley	Up to 16 ha (40 acres) of upland and bottomland hardwood habitat with a moderate significance rating for biodiversity could be lost at the Greenfield Site; up to 0.4 ha (1 acre) of upland habitat that could be lost in the 7600 Area of Melton Valley
Cultural Resources				
<u>Construction</u>	No FRP construction or other activities that could potentially affect cultural resources	Temporary visual effects possible within the ORNL Historic District, but would be similar to effects of other projects occurring in the area	Temporary visual effects possible within the ORNL Historic District, but would be similar to effects of other projects occurring in the area	Temporary visual effects possible within the ORNL Historic District, but would be similar to effects of other projects occurring in the area
<u>Operations</u>	No change to cultural resources	Changes to cultural resources could occur as a result of demolishing up to four buildings, but would be mitigated per agreement with the SHPO	Changes to cultural resources could occur as a result of demolishing up to six buildings and interior remodeling of other buildings, but would be mitigated per agreement with the SHPO	Changes to cultural resources could occur as a result of demolishing up to six buildings and interior remodeling of other buildings, but would be mitigated per agreement with the SHPO

**TABLE 5.15–1.—Summary of Environmental Consequences for the ORNL Facilities Revitalization Project Alternatives
(continued)**

Resource/Material Categories	Alternative 1 - No Action	Alternative 2 - Remodel	Alternative 3 - Brownfield	Alternative 4 - Greenfield
Air Quality				
<u>Construction</u>	No air emissions as a result of FRP activities	Negligible temporary air emissions from heavy equipment and dust as a result of demolishing up to four buildings and remodeling activities	Negligible temporary increases air emissions from heavy equipment and dust as a result of demolishing up to six buildings, constructing new buildings and other FRP activities	Negligible temporary increases air emissions from heavy equipment and dust as a result of demolishing up to six buildings, constructing new buildings and other FRP activities; dust control measures would be extensive during Greenfield site preparation
<u>Operations</u>	No change in air emissions	No change in air emissions	No change in routine air emissions; minor improvements as a result of more efficient systems possible	No change in routine air emissions; minor improvements as a result of more efficient systems possible
Noise				
<u>Construction</u>	No change in on-site noise levels	Temporary increases in noise levels during remodeling and demolition, but would be expected to be limited to the central ORNL industrial area; no appreciable changes in off-site noise levels	Temporary increases in noise levels during construction and other FRP activities, but would be expected to be limited to the central ORNL industrial area; no appreciable changes in off-site noise levels	Temporary increases in noise levels during construction and other FRP activities, but would be expected to be limited to the central ORNL industrial area; no appreciable changes in off-site noise levels
<u>Operations</u>	No change in on-site noise levels	No change in on-site noise levels	No change in on-site or off-site noise levels	No change in on-site or off-site noise levels with the exception of minor localized increases at Greenfield Site

**TABLE 5.15–1.—Summary of Environmental Consequences for the ORNL Facilities Revitalization Project Alternatives
(continued)**

Resource/Material Categories	Alternative 1 - No Action	Alternative 2 - Remodel	Alternative 3 - Brownfield	Alternative 4 - Greenfield
Socioeconomics				
<u>Construction</u>	No change to area economics or demographics	No appreciable change in employment, area economics or demographics	Temporary increases in construction worker employment levels that would be negligible on a regional basis; no changes in housing or infrastructure demands	Temporary increases in construction worker employment levels that would be negligible on a regional basis; no changes in housing or infrastructure demands
<u>Operations</u>	Potential for decline in employment and economy on a local level	No change to area economics or demographics	No change to economics or demographics on a regional basis; potential localized benefits through retention of employment and income in the area	No change to economics or demographics on a regional basis; potential localized benefits through retention of employment and income in the area
Environmental Justice				
<u>Construction</u>	No change	No change or disproportionate effects with respect to environmental justice	No change or disproportionate effects with respect to environmental justice	No change or disproportionate effects with respect to environmental justice
<u>Operations</u>	No change or disproportionate effects with respect to environmental justice	No change or disproportionate effects with respect to environmental justice	No change or disproportionate effects with respect to environmental justice	No change or disproportionate effects with respect to environmental justice

**TABLE 5.15–1.—Summary of Environmental Consequences for the ORNL Facilities Revitalization Project Alternatives
(continued)**

Resource/Material Categories	Alternative 1 - No Action	Alternative 2 - Remodel	Alternative 3 - Brownfield	Alternative 4 - Greenfield
Transportation				
<u>Construction</u>	No change in number of vehicles	No appreciable change in number of vehicles	Temporary increases in traffic flow on Bethel Valley and other nearby roads due to construction workers and equipment; this would be offset by recent declines in daily traffic by long-term employees	Temporary increases in traffic flow on Bethel Valley and other nearby roads due to construction workers and equipment; this would be offset by recent declines in daily traffic by long-term employees
<u>Operations</u>	No change in number of vehicles	No change in number of vehicles	Potential minor increases in traffic flow on Bethel Valley and other nearby roads; this would be offset by recent declines in daily traffic by long-term employees	Potential minor increases in traffic flow on Bethel Valley and other nearby roads; this would be offset by recent declines in daily traffic by long-term employees
Land Use				
<u>Construction</u>	None	Approximately 2 ha (5 acres) temporarily used as laydown areas for remodeling and other activities - no undisturbed land used	Up to 12 ha (30 acres) temporarily disturbed for site preparation and laydown areas	Up to 18 ha (45 acres) temporarily disturbed for site preparation and laydown areas

**TABLE 5.15–1.—Summary of Environmental Consequences for the ORNL Facilities Revitalization Project Alternatives
(continued)**

Resource/Material Categories	Alternative 1 - No Action	Alternative 2 - Remodel	Alternative 3 - Brownfield	Alternative 4 - Greenfield
<u>Operations</u>	No change in land use	Approximately 0.2 ha (0.5 acres) cleared as a result of demolition of four buildings - no net change; land use designation would remain Institutional/Research	Approximately 0.8 ha (2 acres) cleared as a result of demolition of six buildings and construction of one building on previously undisturbed land in Melton Valley - no net change; land use designation would remain Institutional/Research	Approximately 16.5 ha (41 acres) cleared as a result of demolition of six buildings, construction of one building on previously undisturbed land in Melton Valley, and construction of most new buildings and road on Greenfield - change of approximately 16 ha (40 acres) from Mixed Research/Future Initiatives to Institutional/Research land use designations
Land Ownership				
<u>Construction</u>	No FRP construction would occur	DOE only	DOE, State of Tennessee, and private sector	DOE, State of Tennessee, and private sector
<u>Operations</u>	DOE only	DOE only	DOE controlled in all facilities	DOE controlled in all facilities
Visual Resources				
<u>Construction</u>	No FRP construction or other activities	No changes to visual setting or resources during remodeling	No changes to visual setting or resources during remodeling and construction	Some changes to visual setting or resources during remodeling and construction at Greenfield Site along Bethel Valley Road

**TABLE 5.15–1.—Summary of Environmental Consequences for the ORNL Facilities Revitalization Project Alternatives
(continued)**

Resource/Material Categories	Alternative 1 - No Action	Alternative 2 - Remodel	Alternative 3 - Brownfield	Alternative 4 - Greenfield
<u>Operations</u>	No change in visual resources or visual setting	Some change in visual resources or visual setting due to demolition of up to four buildings within ORNL Historic District - consultations and mitigation would be completed	Some change in visual resources due to demolition of up to six buildings within ORNL Historic District - consultations and mitigation would be completed	Some change in visual resources due to demolition of up to six buildings within ORNL Historic District - consultations and mitigation would be completed, Greenfield Site would be downgraded from VMR of III to IV
Infrastructure				
<u>Construction</u>	No FRP related changes would occur	Few changes to utilities would be required for limited remodeling; utilities would be shut down and/or disconnected for deactivated and demolished buildings	Changes to utilities would be required for remodeling; utilities would be shut down and/or disconnected for deactivated and demolished buildings; utilities would be connected to new buildings; electrical distribution system improvements and infrastructure improvements at the east and west “campus” ends of ORNL would be conducted	Utilities and infrastructure, including: lines for potable water and hydrants, sewer and process water, stormwater and drains, natural gas, and telecommunications; relocation of electrical feeder stations, area lighting, and an access road would be installed and connected to the Greenfield Site to accommodate construction of new facilities; electrical distribution system improvements and infrastructure improvements at the east and west “campus” ends of ORNL would still be conducted; changes to utilities would be required for remodeling; utilities would be

**TABLE 5.15–1.—Summary of Environmental Consequences for the ORNL Facilities Revitalization Project Alternatives
(continued)**

Resource/Material Categories	Alternative 1 - No Action	Alternative 2 - Remodel	Alternative 3 - Brownfield	Alternative 4 - Greenfield
<u>Construction</u> (continued)				shut down and/or disconnected for deactivated and demolished buildings; utilities would be connected to new buildings
<u>Operations</u>	Landlord activities and R&D missions would continue	Minor improvements would result within remodeled buildings; negligible changes in utility usage would result from deactivation and demolition of up to six buildings	Improvements to utility efficiency would be anticipated within remodeled and newly constructed buildings; negligible changes in utility usage would result from deactivation and demolition of numerous buildings; improved traffic flow and parking availability would be anticipated	Improvements to utility efficiency would be anticipated within remodeled and newly constructed buildings; negligible changes in utility usage would result from deactivation and demolition of numerous buildings; improved traffic flow and parking availability would be anticipated
Human Health and Worker Safety				
<u>Construction</u>	No construction or other FRP activities would be conducted	Temporary risks of accidents from the operation of heavy equipment and management of construction debris and potential hazardous wastes, but would be mitigated through strict adherence to safe work practices; no effect to the off-site public would be anticipated	Temporary risks of accidents from the operation of heavy equipment and management of construction debris and potential hazardous wastes, but would be mitigated through strict adherence to safe work practices; no effect to the off-site public would be anticipated	Temporary risks of accidents from the operation of heavy equipment would be somewhat greater due to extensive site preparation; management of construction debris and potential hazardous wastes would be the same as for Alternative 3; all could be mitigated through strict adherence to safe work practices; no effect to the off-site public would be anticipated

TABLE 5.15–1.—Summary of Environmental Consequences for the ORNL Facilities Revitalization Project Alternatives (continued)

Resource/Material Categories	Alternative 1 - No Action	Alternative 2 - Remodel	Alternative 3 - Brownfield	Alternative 4 - Greenfield
<u>Operations</u>	Increased risks to workers could potentially increase through time as more engineered and administrative controls would be required to ensure worker safety; no effect to the off-site public would be anticipated	Minor improvements would result within remodeled buildings and as a result of the removal of up to four potentially contaminated buildings; approximately 320 workers would be affected; no effect to the off-site public would be anticipated	Appreciable enhancements would result in working conditions within remodeled buildings and new buildings benefitting approximately 1,100 relocated workers, the removal of up to six potentially contaminated buildings and deactivation of numerous other buildings would reduce the potential for accidents. No effect to the off-site public would be anticipated	Appreciable enhancements would result in working conditions within remodeled buildings and new buildings benefitting approximately 1,100 relocated workers, the removal of up to six potentially contaminated buildings and deactivation of numerous other buildings would reduce the potential for accidents. No effect to the off-site public would be anticipated
Waste Management				
<u>Construction</u>	No construction or other FRP activities would be conducted	Approximately 9,220 m ³ (12,062 yd ³) of waste would be generated as a result of limited remodeling, deactivation, and demolition activities	Approximately 21,462 m ³ (28,072 yd ³) of waste would be generated as a result of construction, remodeling, deactivation, relocation, and demolition activities; an additional 21,538 m ³ (28,172 yd ³) of debris and soil would be generated from site preparation	Approximately 21,462 m ³ (28,072 yd ³) of waste would be generated as a result of extensive site preparation, construction, remodeling, deactivation, relocation, and demolition activities; an additional 328,888 m ³ (430,185 yd ³) of debris and cut soil would be generated from site preparation

**TABLE 5.15–1.—Summary of Environmental Consequences for the ORNL Facilities Revitalization Project Alternatives
(continued)**

Resource/Material Categories	Alternative 1 - No Action	Alternative 2 - Remodel	Alternative 3 - Brownfield	Alternative 4 - Greenfield
<u>Operations</u>	No change in waste generation or waste management facilities would be anticipated	No change in waste generation or waste management facilities would be anticipated	No change in waste generation from R&D missions or waste management facilities would be anticipated; some reductions in waste generated in the course of building maintenance could be realized	No change in waste generation or waste management facilities would be anticipated; some reductions in waste generated in the course of building maintenance could be realized
Cost and Funding				
<u>Capital funding</u>	N/A	\$ 130.2	\$ 439.9 M	\$ 455.5 M
<u>Annual ORNL M&O Cost</u>	\$ 75.7 M/yr	\$ 74.9 M/yr	\$ 53.8 M/yr	\$ 53.8 M/yr